

METHODS AND APPARATUS FOR TRANSFERRING A DATA ELEMENT  
WITHIN A DATA STORAGE SYSTEM

ABSTRACT OF THE DISCLOSURE

5        The invention is directed to techniques for transferring data within a data storage system that includes, among other things, an interconnection mechanism having a point-to-point channel between an interface circuit (e.g., a director) and a volatile memory cache circuit. The point-to-point channel allows the interface circuit and the volatile memory cache circuit to have contention free access to each other. Such access  
10      is superior to the blocking nature of a conventional multi-drop bus topology data storage system. In particular, the contention free access provided by the invention essentially alleviates interconnection mechanism delays, e.g., delays due to other devices using the bus, delays due to bus allocation (e.g., bus arbitration cycles), etc. Furthermore, the point-to-point nature of communications between devices of the data storage system  
15      (e.g., the interface and volatile memory cache circuits) essentially makes such communication independent of the number of devices within the data storage system thus improving scalability of the data storage system. One arrangement of the invention is directed to a data storage system having a volatile memory cache circuit that buffers data elements exchanged between a storage device and a host, an interface circuit that  
20      operates as an interface between the volatile memory cache circuit and at least one of a storage device and a host, and a point-to-point channel interconnected between the volatile memory cache circuit to the interface circuit. The point-to-point channel carries the data elements between the volatile memory cache circuit and the interface circuit.